

## SECTION IV.—RIVERS AND FLOODS.

## RIVERS AND FLOODS, DECEMBER, 1917.

By ALFRED J. HENRY, Meteorologist in Charge.

[Dated: River and Flood Division, Weather Bureau, Jan. 23, 1918.]

During December, 1917, the precipitation east of the Rocky Mountains was largely in the form of snow and the temperature was abnormally low. As a result rivers in northern districts became icebound, and heavy ice formed on Southern rivers, which in conjunction with low stages caused a complete suspension of traffic in many rivers, the Tennessee in particular.

The Mississippi at St. Louis, Mo., reached the lowest level since the beginning of observations, on December 13, when a stage of 2.95 feet below gage-zero was recorded, or 0.4 foot below the previous lowest reading. At the close of the month heavy ice was running at St. Louis, although the stream had been blocked by ice at Hannibal for some days previous.

Heavy rains and warm weather combined to produce flood stages on the rivers of Washington and Oregon during the last third of the month. The first flood on the Willamette crested at Portland, Oreg., on the 20th, and there was a second crest stage on the 31st. On the closing days of the month the small streams of western Washington were in flood. Railroad traffic was interrupted and some loss to bridges was sustained. The details of the flood in the lower Columbia River are shown in Table 1.

Hydrographs for typical points on several principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.

TABLE 1.—Flood stages in the Columbia drainage basin during December, 1917.

River.	Station.	Flood stage.	Above flood stages—dates.		Crest.	
			From—	To—	Stage.	Date.
		<i>Feet.</i>			<i>Feet.</i>	
Columbia.....	Vancouver, Wash.....	15	20	30	15.2	20
Do.....	do.....	15	22	23	15.3	22
Do.....	do.....	15	29	(†)	17.5	31
Willamette.....	Eugene, Oreg.....	10	24	24	11.5	24
Do.....	Albany, Oreg.....	20	25	25	20.5	25
Do.....	Salem, Oreg.....	20	20	21	24.0	20
Do.....	Oregon City, Oreg.....	10	18	(†)	14.5	21
Do.....	Portland, Oreg.....	15	19	24	19.7	20
Do.....	do.....	15	27	(†)	19.3	31
Santiam.....	Jefferson, Oreg.....	10	14	14	10.5	14
Do.....	do.....	10	18	20	16.0	19
Clackamas.....	Cazadero, Oreg.....	12	18	20	18.0	19
Yamhill.....	McMinnville, Oreg.....	35	20	20	38.7	20

† Continued into January, 1918.

## MEAN LAKE LEVELS DURING DECEMBER, 1917.

By UNITED STATES LAKE SURVEY.

[Dated: Detroit, Mich., Jan. 7, 1918.]

The following data are reported in the "Notice to Mariners" of the above date:

Data.	Lakes.*			
	Superior.	Michigan and Huron.	Erie.	Ontario.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
Mean level during December, 1917:				
Above mean sealevel at New York.....	602.16	580.80	572.67	246.45
Above or below—				
Mean stage of November, 1917.....	−0.30	−0.34	−0.30	−0.24
Mean stage of December, 1916.....	−0.97	+0.23	+1.15	+1.08
Average stage for December, last 10 years.....	−0.13	−0.80	+1.09	+1.09
Highest recorded December stage.....	−0.97	−1.78	−0.86	−1.16
Lowest recorded December stage.....	+0.96	+1.80	+1.81	+3.02
Average relation of the December level to—				
November level.....	−0.2	−0.1	−0.1	−0.2
January level.....	+0.3	+0.2	±0.0	±0.0

\* Lake St. Clair's level: In December, 575.53 feet.